



Spectral Gamma-Ray Borehole Log Data Report

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Borehole

30-10-11

Log Event A

Borehole Information

Farm : <u>C</u>	Tank : <u>C-110</u>	Site Number : <u>299-E27-104</u>
N-Coord : <u>42,967</u>	W-Coord : <u>48,570</u>	TOC Elevation : <u>646.00</u>
Water Level, ft :	Date Drilled : <u>4/30/1975</u>	

Casing Record

Type : <u>Steel-welded</u>	Thickness : <u>0.280</u>	ID, in. : <u>6</u>
Top Depth, ft. : <u>0</u>	Bottom Depth, ft. : <u>100</u>	

Borehole Notes:

Borehole 30-10-11 was drilled in April 1975 to a depth of 100 ft with 6-in. casing. The casing thickness is presumed to be 0.280 in., on the basis of the published thickness for schedule-40, 6-in. steel tubing. No information concerning grouting or perforations was available; therefore, it is assumed that the borehole was not grouted or perforated. The top of the casing, which is the zero reference for the SGLS, is even with the ground surface.

Equipment Information

Logging System : <u>2</u>	Detector Type : <u>HPGe</u>	Detector Efficiency: <u>35.0 %</u>
Calibration Date : <u>10/1996</u>	Calibration Reference : <u>GJO-HAN-13</u>	Logging Procedure : <u>P-GJPO-1783</u>

Log Run Information

Log Run Number : <u>1</u>	Log Run Date : <u>03/05/1997</u>	Logging Engineer: <u>Bob Spatz</u>
Start Depth, ft.: <u>0.0</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>16.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>

Log Run Number : <u>2</u>	Log Run Date : <u>03/05/1997</u>	Logging Engineer: <u>Alan Pearson</u>
Start Depth, ft.: <u>98.5</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>15.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>

Log Run Number : <u>3</u>	Log Run Date : <u>03/07/1997</u>	Logging Engineer: <u>Bob Spatz</u>
Start Depth, ft.: <u>50.0</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>30.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>



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Analysis Information

Analyst : D.L. Parker

Data Processing Reference : MAC-VZCP 1.7.9

Analysis Date : 09/09/1997

Analysis Notes :

This borehole was logged by the SGLS in three log runs. One of the log runs was a relog of a previously logged section to provide an additional quality check. The pre- and post-survey field verification spectra met the acceptance criteria established for the peak shape and detector efficiency, confirming that the SGLS was operating within specifications. The energy calibration and peak-shape calibration from these spectra were used to establish the peak resolution and the channel-to-energy parameters used in processing the spectra acquired during the logging operation. There was slight gain drift during the relog run, and it was necessary to adjust the established channel-to-energy parameters to maintain proper peak identification.

Casing correction factors for a 0.280-in.-thick steel casing were applied during analysis.

Shape factor analysis, a data analysis method developed as part of the Hanford Tank Farms Vadose Zone Project, was performed on SGLS data from this borehole.

The only man-made radionuclide detected in this borehole was Cs-137. The presence of Cs-137 was measured continuously from the ground surface to 3.5 ft.

The K-40 concentrations increase at about 43.5 ft and remain elevated to the bottom of the borehole. A gradual increase in K-40 concentrations was detected from about 70 to 90 ft.

Th-232 concentrations increase at about 43.5 ft and remain elevated to about 60 ft. Th-232 concentrations decrease sharply at about 60 ft and are highly variable over the depth of the borehole.

Additional information and interpretations of log data are included in the main body of the Tank Summary Data Report for tank C-110.

Log Plot Notes:

Separate log plots show the man-made and the naturally occurring radionuclides. The natural radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma rays used to calculate the concentrations.

Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots give the MDL. The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.

A combination plot includes the man-made and natural radionuclides, the total gamma derived from the spectral data, and the Tank Farms gross gamma log. The gross gamma plot displays the latest available digital data. No attempt has been made to adjust the depths of the gross gamma logs to coincide with the SGLS data.

A rerun plot that presents data from the rerun log along with data from the original run to show the repeatability of the results.



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A plot of the results of the shape factor analysis for the distribution of gamma-ray energies for this borehole is included.